AMERICAN SOCIETY FOR TESTING MATERIALS

BULLETIN

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"Promotion of Knowledge of Materials of Engineering and Standardization of Specifications and Methods of Testing"

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Symposium on Paint to Feature 1935 Regional Meeting

Philadelphia Selected for Meeting—Group Committee Meetings During Week of March 4

A SYMPOSIUM on Paint and Paint Materials will feature the 1935 Regional Meeting of the Society to be held in Philadelphia on March 6 in conjunction with the Spring Group Meetings of A.S.T.M. Committees scheduled during the five days—March 4 to 8. The hotel at which the meetings will be held will be announced in the near future.

This is the first Society gathering held in this city since March, 1927, when the committees held their group meetings. General arrangements for the 1935 meetings will be in charge of the newly organized Philadelphia District Committee which is announced on page 7 of this BULLETIN.

The Society regional meetings, held each year since 1930 in some leading city have focused the attention of the respective regions on the important work A.S.T.M. is doing in standardization and research. While this promotional aspect is important, of more significance is the opportunity presented to hold technical sessions at which authoritative data and information of a very practical nature is presented on a pertinent materials subject. The topics are usually of particular interest to the regions where meetings are scheduled, for example, the automotive symposium in Detroit, welding in Pittsburgh and rubber in Cleveland. As a choice for the forthcoming meeting, paint is a logical topic because of Philadelphia's importance as a paint manufacturing center.

Interesting Paint Symposium Planned

The Symposium on Paint and Paint Materials will be sponsored by Committee D-1 on Preservative Coatings for Structural Materials which has initiated and directed the work of the Society in standardizing specifications and tests for paints and allied materials and in developing needed information through research. While in recent years there have been formal discussions on such topics as hiding power, pigments, etc., no attempt was made to cover the subject of preservative coatings from the broad viewpoint such as contemplated in the present symposium. In order to develop the symposium, D-1 has appointed a Special Program Committee as follows:

R. L. HALLETT, *Chairman*, National Lead Co.
W. R. FULLER, Pratt & Lambert, Inc.
H. A. GARDNER, The Institute of Paint and Varnish Research.
H. A. NELSON, New Jersey Zinc Co.
W. T. PEARCE, The Resinous Products & Chemical Co.

This group, through meetings and correspondence, has planned the scope of the program and obtained the cooperation of leading technologists to present the papers listed below. The symposium is planned to cover the paint industry in a broad manner and to present information about paint and paint materials that will be of value to the engineers and others in using the products in every-day problems. The papers will be written to appeal to the general user and not solely to the paint technologist. With the broad experience of the members of the Program Committee and of the authors as a background, a very interesting symposium is anticipated.

The program is as follows:

LOOKING INTO THE FUTURE—H. A. Gardner, Chemical Engineer, The Institute of Paint and Varnish Research.

PREPARATION, USE AND ABUSE OF SPECIFICATIONS FOR PAINT MATERIALS—P. H. Walker, Assistant Chief, Chemistry Division, National Bureau of Standards.

PROTECTIVE AND DECORATIVE COATINGS FOR RAILROADS—A. M. Johnsen, Engineer of Tests and Chemist, The Pullman Co.

PAINT TESTING—C. D. Holley, Director of Paint Research, Acme White Lead and Color Works.

VARNISH TESTING—W. R. Fuller, Technical Director, Pratt & Lambert, Inc.

LACQUER AND LACQUER TESTING—H. E. Eastlack, Director, Parlin Laboratory, E. I. du Pont de Nemours and Co.

DRYING OILS—S. O. Sorenson, Chemist, Archer-Daniels-Midland Co.

ZINC PIGMENTS—E. H. Bunce, General Manager, Technical Dept., New Jersey Zinc Co.

LEAD PIGMENTS—R. L. Hallett and C. H. Rose, Chemists, National Lead Co.

TITANIUM PIGMENTS—I. D. Hagar, Eastern Sales Manager, Titanium Pigment Co.

MINERAL PIGMENTS—J. W. Ayers, Director of Research, C. K. Williams and Co.

CHEMICAL COLORS—A. F. Brown, General Manager, Imperial Color Works.

NATURAL AND SYNTHETIC RESINS—W. T. Pearce, The Resinous Products & Chemical Co.

SOLVENTS AND VOLATILE THINNERS—R. M. Carter, Research Chemist, U. S. Industrial Alcohol Co.

Two sessions will be devoted to the symposium, probably afternoon and evening. The papers and ensuing discussion will be published during the summer of 1935.

All A.S.T.M. members and their associates, and all others interested are cordially invited to attend the meeting. Fur-

ther details of the meeting will be given in the January BULLETIN.

Group Committee Meetings

As mentioned previously, the 1935 Spring Group Meetings of Committees will be held from Monday, March 4 to Friday, March 8. The hotel will be selected with due regard to the meeting facilities required by the numerous committees, many of which have already indicated their intention to participate.

It is expected that arrangements will be made with the railroad passenger associations for the granting of the certificate plan of transportation which enables members to save a considerable portion of their railroad fare. The matter of room reservations, schedule of committee meetings, etc., will be discussed in more detail in the next issue of the BULLETIN.

Members of the Society should note on their 1935 calendars, "March 4 to 8, Philadelphia."

Pittsburgh District Committee Reorganizes

Following the adoption by the Executive Committee of the Charter for A.S.T.M. District Committees, the Pittsburgh District Committee held a meeting on November 15 during which a reorganization was effected in accordance with the new Charter and interesting discussion was held on what the committee could do in following out lines of activity indicated in the Charter. The Pittsburgh District Committee was organized in 1930 and sponsored the Pittsburgh Regional Meeting of the Society held in 1931. The terms of the present members of the committee were selected as follows:

For the Term Ending June 30, 1935:

Robert H. Dibble, Metallurgical Engineer, American Sheet and Tin Plate Co.
E. H. Dix, Jr., Chief Metallurgist, Aluminum Research Laboratories, Aluminum Co. of America.
Dean Harvey, Materials Engineer, Westinghouse Electric and Manufacturing Co.
Thomas Spooner, Manager, General Division, Research Laboratories, Westinghouse Electric and Manufacturing Co.

For the Term Ending June 30, 1936:

James Aston, Head, Department of Mining and Metallurgy, Carnegie Institute of Technology.
Max Hecht, Consultant Chemical Engineer.
F. M. Howell, Engineer of Tests, Aluminum Research Laboratories, Aluminum Co. of America.
W. A. Selvig, Chemist, U. S. Bureau of Mines.
J. J. Shuman, Inspecting Engineer, Jones & Laughlin Steel Corp.

For the Term Ending June 30, 1937:

C. F. Buente, Secretary, Concrete Products Co. of America.
A. R. Ellis, Vice-President, Pittsburgh Testing Laboratory.
J. O. Leech, Assistant Metallurgical Engineer, Carnegie Steel Co.
F. N. Speller, Director, Department of Metallurgy and Research, National Tube Co.
Jerome Strauss, Chief Research Engineer, Vanadium Corp. of America.

The committee elected Dean Harvey as Chairman, Dr. James Aston, Vice-Chairman and F. M. Howell, who had served previously, as Secretary. A subgroup on meetings and papers was appointed consisting of Messrs. Dix, Selvig, and Strauss, in order to consider the possibility of local meetings and topics therefor. To evaluate ways and means of extending membership in the district, a group consisting of Messrs. Howell, Shuman and Dibble was appointed. It was felt that there is a good opportunity to further this work and also to stimulate student interest in the Society. It is anticipated that groups charged with particular work will be expanded to include a number of other members in the Pittsburgh area.

Annual Meeting Plans

At recent meetings of the Program Committee of the Detroit Committee on Arrangements and of A.S.T.M. Committee E-6 on Papers and Publications, plans for the 1935 annual meeting technical program were considered and as a result it is expected that a number of interesting topics of wide interest will be included in the general program.

The opening session will probably be featured by an address on the general subject "A Look into the Engineering Materials' Future"—to be presented by an engineer of national prominence. Such a subject should be of interest to all those attending the meeting. One or two other sessions of general interest are in prospect.

The program will include a large number of worthwhile technical papers and most of the Society committees will present their annual reports. Several of the latter promise to be of unusual interest.

Detroit Committee Active

Many of the members in the Detroit area are taking an active part in the plans for the meeting and a Committee on Arrangements has been appointed, the personnel being given below. The Program Committee as mentioned above is closely following developments in the annual meeting technical program and will aid in formulating one which incorporates many features of direct interest to many industries represented in Detroit.

Detroit Committee on Arrangements

F. O. Clements, *Honorary Chairman*, General Motors Corp.
A. E. White, *Chairman*, Univ. of Michigan
C. F. Hirshfeld, The Detroit Edison Co.
F. N. Menefee, Univ. of Michigan
F. M. Zeder, Chrysler Corp.
Chairmen of Committees

Entertainment Committee
F. P. Zimmerli, *Chairman*, Barnes, Gibson, Raymond, Inc.
W. H. Graves, Packard Motor Car Co.
John L. McCloud, Ford Motor Co.
E. W. Upham, Chrysler Corp.
J. M. Watson, Hupp Motor Car Co.
A. H. White, Univ. of Michigan

Finance Committee
W. C. DuComb, *Chairman*, W. C. DuComb Co., Inc.
E. J. Hergenroether, International Nickel Co., Inc.
Herman E. Mayrose, Univ. of Detroit
R. A. Plumb
L. E. Williams, Michigan Engineering Society
W. P. Woodside, Climax Molybdenum Co.

Exhibits Committee
C. H. Fellows, *Chairman*, The Detroit Edison Co.
R. H. McCarroll, Ford Motor Co.
W. E. McCullough, Bohn Aluminum and Brass Corp.
Ralph W. Perry, Perry Testing Laboratory
W. P. Putnam, Detroit Testing Laboratory
H. R. Wolf, General Motors Corp.

Membership Committee
Earl Bartholomew, *Chairman*, Ethyl Gasoline Corp.
A. L. Boegehold, General Motors Corp.
G. G. Brown, Univ. of Michigan
C. S. Kegerries, Holley Carburetor Co.
W. W. Nichols, D. P. Brown and Co.
A. Wallick, Murray Body Corp.

Meetings and Program Committee
T. A. Boyd, *Chairman*, General Motors Corp.
P. J. Baker, Motor Wheel Corp.
S. M. Cadwell, U. S. Rubber Co.
Sabin Crocker, The Detroit Edison Co.
H. C. Mougey, General Motors Corp.

Greeters Committee
Chairmen of Committees
Earl Bartholomew, Ethyl Gasoline Corp.
T. A. Boyd, General Motors Corp.
F. Burton, Consulting Engineer
C. H. Fellows, The Detroit Edison Co.
A. E. White, Univ. of Michigan
F. P. Zimmerli, Barnes, Gibson, Raymond, Inc.

(*Concluded on page 11*)

Long-Time Society Committee Members

Sketches of Long-Time A.S.T.M. Committee Members to Appear in A.S.T.M. Bulletin

BEGINNING with the current issue of the A.S.T.M. BULLETIN, it is planned to present brief notes on long-time members of the Society, who have contributed much to the progress it has made. In general the notes will be confined to members who have been affiliated with the Society for twenty-five years or more and who have been active in committee work for long periods of time. No particular sequence will be followed in this series.

It is planned to cover three members in each issue of the BULLETIN. In the space allotted it will be impossible of course to cover adequately the work of the men either in industry or in the Society. Some of the men may have been officers of the Society, while a great many others have directed the work of committees and served A.S.T.M. in many helpful ways. This at least is true—that while the interests and activities of those whose brief biographical sketches will appear may be very wide and diversified, they will have this strong common bond—belief in the purposes of the Society and long-time service in its behalf.

PRÉVOST HUBBARD, Chemical Engineer, The Asphalt Institute, has been actively connected with highway work for the past thirty years. Following his education at George Washington University, he was with the U. S. Bureau of Public Roads, becoming Chief Chemist. From 1911 to 1915 he was Consulting Chemical Engineer in charge of the Division of Roads and Pavements, Institute of Industrial Research and for this period also was lecturer on the Chemistry of Bituminous Materials, Graduate Department, Columbia University. For four years beginning 1915 Mr. Hubbard was Chief, Division of Road Material Tests and Research, U. S. Bureau of Public Roads. Since 1919 he has been Chemical Engineer of the Asphalt Institute, New York City.

Mr. Hubbard has lectured extensively on bituminous materials and is the author of a great many technical articles and papers some of which appear in the A.S.T.M. *Proceedings* and has written several books. He prepared the article on asphalt in the last edition of the Encyclopaedia Britannica.

In the Society he has an inspiring record of service, having served as secretary of Committee D-4 on Road and Paving Materials for the past twenty-six years and since 1921 he has been secretary of Committee D-8 on Bituminous Waterproofing and Roofing Materials. He is a representative of the A.S.T.M. on the Advisory Board of Highway Research, National Research Council. In 1928 he represented A.S.T.M. at the session held by the British Engineering Standards Association in London, in an effort to harmonize nomenclature on bituminous materials.

In addition to the committees indicated above, he at present holds membership on Committee E-1 on Methods of Testing and since 1920 has been a member of Committee E-8 on Nomenclature and Definitions.

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JESSE J. SHUMAN, Inspecting Engineer, Jones & Laughlin Steel Corp., became a member of the Society in 1902 and since that time he has missed attendance at but one annual meeting. A review of his life indicates two very interesting points—first, his long-time connection with his present company and, second, his intense activity on a large number of technical committees.

Immediately after graduating from Northwestern University, in 1890, he was employed by Illinois Steel Co., South Works, later being transferred to the Joliet Works. During this period the Joliet Plant undertook to start its rail mill on rails selling for $18 per ton in competition with Andrew Carnegie's amazing price of $17. These were bessemer steel, since open-hearth rails had not made any headway at that time. The enterprise was a success and typical of measures taken toward recovery during that industrial depression. Later he was Assistant General Superintendent, Newburgh Steel Works, Cleveland and since June, 1900, has been with his present company.

As a member during the War of the Metallurgical Advisory Committee, he assisted in drawing specifications for shell steel. He has been active in the work of the Association of American Steel Manufacturers' Technical Committees and has taken a leading part in the Technical Committee for the Iron and Steel Code Authority.

In the Society he has been an active member of the Steel Committee for many years and has served as chairman of its Subcommittee on Commercial Bar Steels since its formation in 1916. For many years he has participated in the work of Committee A-5 on Corrosion of Iron and Steel and is interested in the work of Committee E-1 on Methods of Testing.

One of his very important contributions to Society work has been in connection with the activities of the Research Committee on Investigation of the Effect of Phosphorus and Sulfur in Steel.

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H. E. SMITH, Consulting Chemist and Materials Engineer, joined the Society in the year of its incorporation, 1902. After graduating from Massachusetts Institute of Technology in chemistry, he was employed by the Chicago, Milwaukee, and St. Paul Railroad, subsequently becoming Chief Chemist. In 1902 he became associated with the Lake Shore and Michigan Southern Railway as Chemist and Engineer of Tests and organized their testing department. When this company was consolidated into the N. Y. C. R. R. he became Engineer of Tests of the latter in 1916. Granted a leave of absence from 1918 to 1920, he served on the general staff of the U. S. Railroad Administration in charge of the inspection of materials for new equipment purchased. When the testing department of the N. Y. C. R. R. was expanded to the N. Y. C. Lines' organization, he was made Engineer of Tests. From 1926 to 1932 he was engineer of materials in

(Concluded on page 12)

District Committees to be Reorganized

New Charter Provides More Permanent Basis and Greater Autonomy

THE Executive Committee of the Society has felt for some time that the experience gained in the conduct of work of the various District Committees pointed to the desirability of reorganizing those committees upon a more permanent basis, conferring upon the committees authority and responsibility for important work in the Society and giving them a greater degree of autonomy. Such a reorganization is now provided through a Charter for District Committees, adopted by the Executive Committee in June, 1934. This Charter is given in full below.

The first district committees of the Society were organized in 1929, one in the Detroit District and the other in the Chicago-Milwaukee District. The plan to form these various groups resulted from careful study of appropriate and effective ways of bringing the Society closer to a larger number of members in a particular district and at the same time stimulating interest in the Society in that particular section of the country. In addition to the two districts named above, committees have been organized in Cleveland, New York, Pittsburgh and three on the West Coast—Northern California, Seattle District and Southern California.

Features of New Charter

There are several noteworthy features in the Charter for District Committees. Members are appointed by the Executive Committee for terms of three years, so arranged that the terms of approximately one-third of the membership expire at each annual meeting of the Society. The District Committee is to have power to fill vacancies, subject to approval of the Executive Committee. The District Committee is to elect its own officers, who will serve for terms of two years.

The purposes and duties of the District Committee are set forth in Article III, Section 1. Items (*a*), (*b*) and (*c*) cover functions and activities that to a greater or less extent have been practiced by various committees. Items (*d*) and (*e*), however, having to do with closer participation of the industries in given localities in the research and standardization work of the Society and the appointment of committees of members within the district, where desired, to study questions concerning specifications and tests for materials, are essentially now purposes for which there is a need, particularly in our Pacific Coast districts.

A number of lines of activity for district committees have been considered. These include the holding of at least one local meeting a year devoted to discussion of some live topic in the materials field with possible discussion of one or more of the annual meeting papers of particular local interest.

District committees, by reviewing annual committee reports and new tentative standards, provide an opportunity for critical study of this phase of Society work from the particular viewpoint of local industrial and technical activities. The District Committee can assist the Papers Committee by recommending topics of particular interest to the members of the district and directing attention to research work in materials that might warrant the presentation of a formal paper before the Society. Finally, extension of Society membership is extremely important and the district groups can do effective work among local men and industries.

CHARTER FOR DISTRICT COMMITTEES

I. Appointment of Members

1. A committee of members of the Society residing in a stated locality may be appointed by the Executive Committee of the Society for the purposes and having the duties defined hereinafter. Such a committee shall be known as the " (name of locality) District Committee."

2. The number of members of a District Committee will be determined by the Executive Committee of the Society, having regard for the number of members in the locality and the character and diversity of the industrial and technical interests therein.

3. The members shall be appointed for a term of three years expiring at the Annual Meeting of the Society, so arranged as to provide for continuance in office at the time of each Annual Meeting of approximately two-thirds of the membership. Members shall be eligible for reappointment.

4. The District Committee shall have power to fill, for the unexpired term, vacancies in its membership that occur by death, resignation or otherwise. Such appointments shall be subject to approval by the Executive Committee of the Society.

II. Officers and Their Election

1. The officers of a District Committee shall be a Chairman, a Vice-Chairman and a Secretary, who shall have the duties and responsibilities usually associated with those offices.

2. The officers shall be elected by the District Committee from among its own membership, and shall serve for a term of two years or until their respective terms of membership on the Committee expire. In the latter event, if reappointed as a member, such officer may continue in office without further election for the term for which he was elected.

3. Election of officers shall be held in the even-numbered years prior to the Annual Meeting of the Society. Officers shall be eligible for re-election.

4. If an office shall become vacant by death, resignation or otherwise, a successor shall be elected by the Committee for the unexpired term.

III. Purpose and Duties

1. The appointment of a District Committee is intended to provide a means of advancing the interests of the Society in a given locality, and of furthering the purposes for which the Society is organized, namely: "Promotion of Knowledge of Materials of Engineering and Standardization of Specifications and Methods of Testing." To this end the District Committees are given the following authority and responsibilities:

(*a*) To arrange for meetings of members in the District and their guests, at which technical papers may be presented, committee reports, specifications and methods of test of the Society discussed, or other topics within the field of the Society presented for consideration.

(*b*) To sponsor Regional Meetings of the Society, for which arrangements shall be made in conference with the Executive Committee of the Society and the Committee on Papers and Publications.

(*c*) To aid the Executive Committee and the various administrative committees of the Society in such matters as extension of Society membership, promotion of use of A.S.T.M. standards, stimulation of interest in the research and standardization activities of the Society, and procuring of papers for the Annual Meetings of the Society.

(*d*) To arrange, in consultation with the Executive Committee of the Society, for closer participation of the industries of the locality in the research and standardization work of the Society, through representation upon the committees of the Society and in other ways.

(*e*) To appoint committees of members within the District to study questions concerning specifications and tests for materials that may have special local interest, and to arrange through the Executive Committee for cooperation and contact with local committees of other districts and with the research and standing committees of the Society.

2. Each District Committee shall have authority to adopt such rules as it may desire for the conduct of its activities, consistent with the by-laws and other regulations of the Society.

3. Each District Committee shall make annually in October a report of its work to the Executive Committee of the Society.

IV. Finances

1. Stationery will be furnished to the officers of District Committees by the Society.

2. Expense for postage incurred in the business of District Committees will be assumed by the Society.

3. Each District Committee shall have authority to raise funds for support of its activities, by voluntary contribution from members in the district, or by other means if approved by the Executive Committee of the Society. Such funds, together with any monies appropriated to the Committee from Society funds, shall be administered by the District Committee under such provisions as the Committee itself may determine. Each District Committee shall include in its annual report a statement of receipts and disbursements for the year.

Cylinder *Versus* Cube *Versus* Prism as the Compression Test Specimen for Mortars

By Herbert J. Gilkey[1]

A thorough study of the A.S.T.M. publication set-up by the Committee on Papers resulted in certain recommendations affecting the A.S.T.M. BULLETIN —notably, the gradual expansion of the BULLETIN to include interesting articles which previously could not have been included in Society publications. These would include certain types of papers on materials subjects, interim committee reports, proposed specifications issued for information and comment and other material as outlined in the 1933 Report of the Papers Committee. The paper which follows is a first step in the policy of gradual BULLETIN expansion.—*Editor.*

IN making compression tests of mortars, the present practice is divided between the use of the 2 by 4-in. cylinder and the 2-in. cube. Obviously, it is undesirable that two types of specimens should be used for a test, but there is no indication that either type can be adopted as standard, to the exclusion of the other, without creating seemingly justifiable objection from the users of the type discarded.

It is desirable that the subject of what constitutes the best specimen for compression tests of mortars be brought into the open and studied critically. It is proposed, therefore, to review the testing of mortars under the following headings:

1. Why tests on mortars are made.
2. The advantages of the cube as a compression specimen.
3. Disadvantages of the cube.
4. The advantages of the 2 by 4-in. cylinder as a compression specimen.
5. Disadvantages of the 2 by 4-in. cylinder.
6. The 2 by 2 by 4-in. prism as a compression specimen preferable to either the 2-in. cube or the 2 by 4-in. cylinder.
7. Miscellaneous comments.

Discussion

1. Compression tests may be made on mortars for the following reasons:

(*a*) *Acceptance tests for cement or fine aggregate.* Up to the present time, at least, such acceptance tests have involved only the determination of the ultimate compressive strength of the specimen at one or more ages, and, on the whole, the 2-in. cube has probably been more in favor for such tests than the 2 by 4-in. cylinder. To this statement there are notable exceptions, due mainly to the fact that even a commercial laboratory interested in no properties other than strength may have stocked the 2 by 4-in. molds and have developed a testing technique well adapted to the use of the cylinder.

(*b*) *Tests in connection with research programs.* Until recently these, too, were restricted to the determination of ultimate compressive strengths for various mixtures, curing conditions, test ages, aggregates, cements, and so forth. During the past few years, however, there has been a tendency for the interest to broaden to properties other than ultimate strength, such as Young's modulus, Poisson's ratio, elastic and plastic behavior under repeated, impact and sustained loading, absorption, durability and/or others. It has been demonstrated that these properties can be secured from small mortar specimens with the same degree of reliability and uniformity as from the larger specimens generally used heretofore when the determination of such properties has been desired.

Moreover, it is believed there is increasing appreciation of the fact that the investigation of mortars probably offers a more fertile field for gaining fundamental knowledge of portland-cement mixtures than do tests of the concrete itself. This is because the coarse aggregate as a variable can be excluded from consideration during the preliminary stages of an investigation, smaller specimens can be used, and, for a program representing a given outlay, the variables studied can be covered more thoroughly than would be possible with the larger specimens and the somewhat more erratic findings to be expected from tests of concrete. It is true, of course, that trends discovered from tests of mortars will need finally to be verified by running limited auxiliary series of tests on concretes.

Another factor is that the manpower requirement for carrying through a program of mortar tests is greatly reduced because of the smaller specimens that can be employed. Whereas relatively few laboratories in this country are properly equipped or can afford to conduct sizable investigations of concrete, there are many laboratories in which interested individuals can carry on valuable and well-controlled researches on mortars and thereby determine relationships which with little modification may be expected to hold for concretes.

While it would be undesirable to burden the technique of routine acceptance tests, in which the only property desired is the ultimate strength of the material, with operations needed only in connection with research work, it would be equally unfortunate to adopt as a standard specimen one which is not adapted for use in the research laboratory.

2. The advantages of the cube as a compression specimen. The advantages of the 2-in. cube are real and obvious:

(*a*) It is compact.

(*b*) The molds are relatively simple.

(*c*) The specimen does not require capping, since there are two pairs of plane sides adjacent to the sides of the mold, either pair of which can be used as top and bottom respectively in making the compression test. Incidentally, this is the outstanding argument for the use of the 2-in. cube instead of the 2 by 4-in. cylinder.

(*d*) The 2-in. cube has been commonly used in compression tests on stones and there may be a small advantage in using a specimen of the same size and shape as that which might be used in some cases for determining the properties of stone for aggregate or for other uses. At best it is not felt that this point should be rated as an important consideration.

3. Disadvantages of the cube:

(*a*) The specimen is so short that it is not possible to measure strains satisfactorily. Thus the ultimate strength is about the only important property that can be obtained when the cube is used.

(*b*) Because of the relative shortness, the top and bottom shear cones overlap and cannot develop independently of one another. Moreover, the effects of end restraint from the lateral friction developed by the testing plates may affect the specimen throughout a considerable part of its height.

(*c*) The stress distribution in the vicinity of the corners is probably affected adversely, especially in the later stages of the test.

(*d*) The fact that the cube is tested on its side, as cast, probably introduces some eccentricity of resistance. Any accentricity of resistance is objectionable of course, since it effects the results of the test in the same manner as would eccentricity of load on a specimen the cross-section of which was uniformly stiff. It is known that there is some difference in density between the top and the bottom of any pouring of concrete or mortar, but in general it may be assumed that the material is reasonably uniform at any particular elevation in the pour. What the difference might amount to when the

(*Concluded on page 10*)

[1]Head, Dept. of Theoretical and Applied Mechanics, Iowa State College

American Society for Testing Materials

BULLETIN

Number 71 **December 31, 1934**

Standardization Program Always Advancing

WHILE the total number of A.S.T.M. Standards and Tentative Standards, 729, as of January 1, 1935, is an indication of the very widespread extent of the Society's work in this field, nevertheless the A.S.T.M. Standardization Program seems always to be filled with new projects to be undertaken.

The duty of reviewing the A.S.T.M. standards program as a whole and in determining whether there are any particular fields in which the A.S.T.M. should initiate work is in the province of Committee E-10 on Standards. There are a number of new projects in view and it is expected work will be started on some of them shortly.

For example, there is a demand for the development of tests for zeolites for water softening and this has been referred to Committee D-19 on Water for Industrial Uses, which committee will form a subgroup to handle this problem.

The question of thermal insulating materials is being studied and it has been suggested that information be developed at a conference of the interested parties, similar to the conferences held last year on gaseous fuels. See page 8.

Those interested in fibre conduit have indicated the desirability of developing standard tests and specifications for this material, and there is a possibility that requirements for asphalt floor tile may be referred to one of the A.S.T.M. groups for development.

Other materials suggested include "Plaster Bond" and bearing metals. The former was referred to Committee D-8 on Bituminous Waterproofing and Roofing Materials for development. The question of organizing a committee on bearing metals, possibly a joint committee, has been referred to the Coordinating Committee on Non-Ferrous Metals and Alloys for its recommendation.

Comments from the members, on the A.S.T.M. standardization work are at all times welcome. As a service Society it can undertake work and best function when the needs of industry are brought promptly to the attention of Society officers or the standing committees.

A.S.T.M. and the Engineering Schools

If the work which the Society is doing is to achieve its maximum usefulness, it is essential that knowledge of the services A.S.T.M. can render in standardization and research should be widespread and it is important that the engineering students should be familiar with A.S.T.M.

While there are various ways in which A.S.T.M. work is brought to students' attention, brief mention is made below of two of these—the awarding of student membership as prize awards and the increasing use of A.S.T.M. publications in engineering curriculums.

Student Membership Prize Awards

To the growing list of schools where student membership prize awards have been established by members of the Society was added recently the University of Illinois, where S. H. Ingberg, Chief, Fire Resistance Section, National Bureau of Standards, is sponsoring two awards. The complete list of schools where such awards are now in effect, together with the names of the sponsors, follows:

Cornell University—J. B. Johnson
Massachusetts Institute of Technology—A. W. Carpenter
University of Pennsylvania—C. L. Warwick
Rensselaer Polytechnic Institute—T. R. Lawson
Detroit Institute of Technology—F. O. Clements
Grove City College—A. E. Pew, Jr.
University of Kansas—Walter Bohnstengel
University of Illinois—S. H. Ingberg
University of Washington—I. L. Collier

Thus far a number of deserving students have been apprised of the Society's work and at the same time have received publications which should be of direct interest and of help in their studies, including the compilation of A.S.T.M. Standards for Engineering Students, A.S.T.M. Bulletin, preprints of technical reports and papers, A.S.T.M. Year Book, etc.

The intrinsic value of a student membership is far more than is indicated by the dues, $1.50, and it means much to the Society and may have a far-reaching effect on its future progress to have prospective engineers acquainted early with the value of the work. The faculties of the various schools have gratefully accepted the awards which have been established and it is hoped that the benefits which accrue may lead other members of the Society to sponsor awards.

A.S.T.M. Publications in Engineering Curriculums

A few years ago on the recommendation of members who studied the question of A.S.T.M. contacts with engineering schools, a special compilation of standards was prepared to familiarize students in materials and similar courses with the availability of standard specifications and tests, and with their importance and the necessity for conducting laboratory work in a definite procedure so that comparative results can be obtained. This volume—Selected A.S.T.M. Standards for Students in Engineering—is used in over sixty leading American colleges and its importance in furthering knowledge of A.S.T.M. cannot be overestimated.

The increasing use of special compilations of A.S.T.M. standards is very significant. Many of the schools giving textile courses use the compilation of Standards on Textile Materials sponsored by Committee D-13, and the collection of Petroleum Standards sponsored by Committee D-2 is also widely used.

The use of A.S.T.M. publications as indicated above may serve to point out the value with which they are viewed by engineering faculties and indicate their potentialities in adding to the practical nature of instruction—at the same time giving students an opportunity to become more closely acquainted with A.S.T.M.

Dudley Medal Committee Appointed

The Executive Committee has appointed the following to constitute the Committee on Award of the Charles B. Dudley Medal:

J. R. Freeman, *Chairman*, Technical Dept., American Brass Co., Waterbury, Conn.
Allen Rogers, Supervisor, Course in Industrial Chemical Engineering, Pratt Institute, Brooklyn, N. Y.
H. J. Gilkey, Head, Department of Theoretical and Applied Mechanics, Iowa State College, Ames, Iowa.

The committee will review the eligible technical papers presented at the 1934 annual meeting and select the one of outstanding merit which constitutes an original contribution on research in engineering materials. Award of the Medal will be made at the Thirty-eighth Annual Meeting in Detroit.

The Dudley Medal was established in 1925 by voluntary subscriptions from the Society members as a means of stimulating research, suitably recognizing outstanding contributions to the *Proceedings* and in commemoration of Charles B. Dudley, first A.S.T.M. president, who served in that office from 1902–1909.

1934 Book of Tentative Standards Issued

The 1934 edition of the Book of A.S.T.M. Tentative Standards was recently issued and distribution has been made to those who ordered copies. There are 1257 pages in the book, compared with 1136 in the 1933 edition. Of the 236 tentative specifications, test methods, and definitions, 48 were approved this year and are included for the first time. Revised tentative standards are given in their latest approved form and all of the *proposed* revisions in standards are also given—some 60.

This is the only publication which gives *all* of the A.S.T.M. tentative standards. In order that members, who may not have in mind clearly what the publication covers may realize its significance, a complete table of contents is enclosed with this BULLETIN. A convenient order blank, listing the special prices to members, is also included.

Annual Meeting Papers

In the Circular to Members No. 229, sent on December 1 to each A.S.T.M. member, an invitation was extended to offer papers on subjects relating to the properties or testing of engineering materials for presentation at the 1935 annual meeting in June. Because of the A.S.T.M. policy of preprinting papers and reports in advance of the meeting, it is essential that the program be developed as early as possible.

The limiting date fixed for receipt of offers is February 23, but members who are thinking of submitting a paper are urged to send their offers as soon as possible. Offers must be accompanied by a summary of the proposed paper in sufficient detail to make clear its scope and to point out the features that in the author's opinion make the paper a desirable one for presentation and discussion at the meeting.

Invitations to submit papers are not limited to A.S.T.M. members and many outstanding technical contributions to our *Proceedings* have been made by men who were not affiliated with the Society.

The Committee on Papers and Publications in its review of the papers offered endeavors to develop a balanced technical program. The committee welcomes suggestions of pertinent subjects from members who for various reasons are not in a position to offer papers.

Philadelphia District Committee Formed

There has been a growing feeling that the organization of a District Committee in Philadelphia would be an appropriate move in advancing society work. The Executive Committee has considered this and as a result the following members have been appointed:

Terms Expiring June, 1935
C. N. Forrest, Special Technical Representative, The Barber Asphalt Co.
W. T. Pearce, Resinous Products and Chemical Co.
J. B. Sidebotham, Jr., John Sidebotham, Inc.
G. H. Woodroffe, Metallurgical Engineer, Reading Iron Co.

Terms Expiring June, 1936
Alexander Foster, Jr., Vice-President and Manager, Sand and Gravel Dept., Warner Co.
W. H. Fulweiler, Chemical Engineer, United Gas Improvement Co.
H. M. Hancock, Superintendent, Inspection Dept., Atlantic Refining Co.
A. R. Wilson, Engineer of Bridges and Buildings, Pennsylvania Railroad Co.

Terms Expiring June, 1937
G. H. Clamer, President and General Manager, The Ajax Metal Co.
Harold Farmer, Chief Chemist, Philadelphia Electric Co.
N. L. Mochel, Metallurgical Engineer, Westinghouse Electric and Manufacturing Co.
L. G. Wilson, President and General Manager, Precision Thermometer and Instrument Co.

At the organization meeting on Monday, December 17, H. M. Hancock was elected Chairman, Alexander Foster, Jr., Vice-Chairman and Harold Farmer, Secretary. This District Committee will serve as a local committee on arrangements for the 1935 Regional Meeting of the Society which is to be held in Philadelphia. Various suggestions as to arrangements for dinner, entertainment, etc., were discussed at the organization meeting.

Proceedings Available Soon

Distribution of the *Proceedings* of the 1934 annual meeting will be made shortly, since printing has been completed and the volumes are now in the bindery.

Part I, Committee Reports (1345 pages), contains the annual reports of 39 standing committees and of five joint and sectional committees. All of the 48 new tentative standards are included as well as the newly revised tentative standards and the large number of proposed revisions of standards. Included in the material not preprinted in advance of the annual meeting are the following: Report on Effect of Added Phosphorus on Low-Carbon Steel, Description of the Wire Corrosion Test Program, Discussion on Use of the Tension Test for Judging the Suitability of Sheet Metals for Various Purposes and a paper describing a proposed method for testing the adhesion of rubber to metal.

Part II, Technical Papers (950 pages), includes the Edgar Marburg Lecture on "Water as an Industrial and Engineering Material" and the 44 technical papers presented at the annual meeting. Of these, 13 relate to the ferrous and non-ferrous field, 10 to cement, concrete, clay products and masonry, while 21 discuss materials' problems involving paint, gasoline, rubber, fire-retardant wood and the testing of numerous other products. It was not possible to preprint a number of the papers and members will find these of much interest together with the considerable amount of very interesting and informative discussion presented at the meeting or submitted since by letter.

It is of interest to note that the 1934 *Proceedings* aggregate 2295 pages compared with a corresponding figure of 1896 for the 1933 *Proceedings*.

Consolidated Standardization Project Approved in Petroleum Products

The American Standards Association, by action of its Standards Council on October 10 approved the proposal made by A.S.T.M. of the initiation of a consolidated project in the field of petroleum products and lubricants to include specifications, methods of test and nomenclature. This involves the consolidation and extension of the projects for Methods of Testing Petroleum Products and Lubricants (Z11) and Specifications for Fuel Oils (K19). The proposed scope involves crude petroleum and petroleum products including lubricants containing petroleum, but excludes products used as road paving or waterproofing materials, or relating to organic chemicals or products used medicinally.

As a result of this action a new sectional committee will be organized to carry on the work, A.S.T.M. acting as sponsor for the project. An advisory group consisting of representatives of organizations directly concerned is being formed to handle the formation of the committee.

New Standing Committee on Gaseous Fuels to be Organized

For some time there has been under consideration a proposal that the Society form a new standing committee to undertake standardization work in the field of gaseous fuels. Two conferences were held during the year at which representatives of many of the interested organizations considered the proposal. Based on the recommendations of this group a standing committee has been authorized and a steering committee under the chairmanship of Mr. A. C. Fieldner, Chief Engineer, Experiment Stations Division, U. S. Bureau of Mines, with R. M. Conner, Director, American Gas Association Laboratory serving as secretary, is developing the committee organization.

It has been recommended that the scope of the committee "include nomenclature and the standardization of methods of sampling and testing gaseous fuels so far as they apply to purchases and sales and the requirements of regulatory bodies. Methods intended primarily for use in process control shall be excluded." The committee at its organization meeting will give further consideration to this proposed scope.

Applied Mechanics Journal Announced

The Applied Mechanics Division of the American Society of Mechanical Engineers will publish a Journal of Applied Mechanics, the first issue being scheduled for March, 1935. The Journal will appear four times a year.

The scope includes original papers in general mechanics, elasticity, hydro-dynamics, aerodynamics, strength of materials and thermodynamics, similar to those published during the past few years in the *Transactions* of the Applied Mechanics Division of the A.S.M.E. The industrial applications of research covered in the papers will continue to be emphasized. The Journal will also contain book reviews and progress reports of research work in engineering mechanics. J. M. Lessells, Swarthmore, Pa., will be Technical Editor.

The annual subscription price to non-members, A.S.M.E., will be $5.00 payable to the A.S.M.E. Applied Mechanics Fund, 29 W. Thirty-ninth Street, New York City.

Marburg Lecture Published as Reprint

The 1934 Edgar Marburg Lecture on "Water as an Engineering and Industrial Material," delivered at the last annual meeting in Atlantic City by Sheppard T. Powell, Consulting Chemical Engineer, Baltimore, will be included in the current *Proceedings* and because of the widespread interest in this subject has also been issued in reprint form.

There is presented current thought on such problems as the following: Removal of suspended solids from water, effect of color on industrial water supplies and detrimental effect and removal of manganese. A considerable portion of the lecture discusses the treatment of water for use in boilers.

The section on influence of concentrated boiler-water salines on cracking of boiler steel and prevention of caustic embrittlement is important in view of the failure of boilers from this cause.

Reprints of the lecture, aggregating 45 pages, are available to members at the special price of 35 cents each.

Work of Committee on Coal Classification

At a meeting at State College, Pa., of the Technical Committees on Coal Classification and on Nomenclature, divisions of the Sectional Committee on Classification of Coals sponsored by A.S.T.M. under the procedure of the American Standards Association, progress was reported in the formulation of requirements for classification of coals by type, that is, by varieties such as common or bright, splint, cannel and boghead.

Since publication of the Tentative Specifications for Classification of Coals by Rank (D 388 – 34 T), some criticisms and suggestions for improvement have been made, particularly regarding the boundary line of fixed carbon between the low-volatile bituminous coal group and the medium-volatile bituminous coal group. Consideration will be given to the feasibility of dividing these two groups into three in order to get a closer grouping of coals of similar properties.

Subcommittee VI on Correlation of Scientific Classification with Use Classification is preparing a chart showing the relative importance of various chemical and physical properties of coals for different uses. Subcommittee VII on Defining Coal Sizes and Coal Friability reported gratifying progress in the formulation of a method of test for screen analysis of bituminous coal. This method is to cover sampling procedure, screen specifications, and method of making the screen test. The subcommittee has accepted in principle, for study, the method of describing coal sizes in terms of limiting screen sizes with tolerances for oversize and undersize.

Committee on Concrete Discontinued

The Executive Committee, after considering fully the present status of A.S.T.M. relationship to the subject of reinforced concrete and especially to the work of the Joint Committee on Specifications for Concrete and Reinforced Concrete decided at its meeting on October 9 that there was no longer a logical place in the Society for a committee on this subject and voted to discontinue Committee C-2 on Reinforced Concrete.

The Tentative Rules for Inspection of Concrete and Reinforced Concrete Work (C 44 – 22 T), written by Committee C-2, will be referred to the Joint Committee for recommendation on their disposition.

Corrosion Tests on Wire and Wire Products

Committee A-5 Undertakes Extensive Research Program

FOR several years, Committee A-5 on Corrosion of Iron and Steel has been considering plans for a systematic study of the outdoor atmospheric corrosion of galvanized wire and wire products. Prior to June, 1933, a special committee under the chairmanship of W. H. Finkeldey, Metallurgist, Singmaster & Breyer, made a systematic study of problems involved and corresponded with various interests. Following acceptance of this special committee's report, by Subcommittee VIII on Field Tests of Metallic Coatings of Committee A-5, a committee was appointed to work out details and begin the wire tests which had been recommended. This group, together with an advisory group, comprises the *Wire Test Committee* with the following personnel:

F. F. Farnsworth, *Chairman*, Bell Telephone Laboratories, Inc.
A. P. S. Bellis, J. A. Roebling's Sons Co.
R. U. Blasingame, Dept. of Agricultural Engineering, Pennsylvania State College
J. D. Conover, American Zinc Inst., Inc.
F. M. Crapo, Indiana Steel and Wire Co.
F. C. Elder, American Steel and Wire Co.
W. H. Finkeldey, Singmaster & Breyer
W. M. Floto, American Steel and Wire Co.
H. F. Hanks, Pittsburgh Steel Co.
L. W. Hopkins, American Chain Co.
C. A. Kellogg, Continental Steel Corp.
H. W. Riley, Dept. of Agricultural Engineering, Cornell University
H. E. Smith, Consulting Engineer
L. H. Winkler, Bethlehem Steel Co.

These members, through the interests they represent, bring to the work a thorough knowledge of the manufacture, sale and use of wire products.

This important work has two major objectives: (1) to obtain useful engineering data on materials now generally used for fencing or which offer promise for future use; (2) to assist in setting up national standard specifications for fencing and barbed wire which will afford consumers an adequate guide in purchasing these materials.

The following materials have been selected for exposure to atmospheric corrosion: Farm-field fencing, plain wire, barbed wire, wire strand, chain-link fence.

Test Program

The general test program, complete details of which are given in the annual report of Committee A-5, is as follows: Samples of typical fence fabrics and wires are to be supplied by cooperating manufacturers. With these samples, each supplier will submit information on chemical composition and physical constants of the base metals and coatings, photomicrographs showing the metallic structure of the product and the nature of the bond between base metal and coating. At a central testing laboratory, the commercial identity of all samples will be completely removed by a disinterested director of tests, after they have been carefully checked at the test laboratory to insure that their chemical and physical properties are as intended by the supplier.

Four types of fencing are to be tested as follows:

Type	Gage of Top and Bottom Line Wire	Gage of Intermediate Line and Stay Wires
1	9	9
2	9	11
3	10	12½
4	11	14½

Note.—All samples are to be of standard hinged joint type fence 39 inches high with 6-inch stay spacing.

On these types of fencing, various weights of zinc coating applied by a variety of coating processes will be represented. The weight of coating classes will range from 0.2 oz. to 1.8 oz. per square foot of uncoated wire surface. Coatings still heavier than 1.8 oz. will be tested if such samples are available when the tests are begun. Four types of stainless steel fencing will also be tested and, if available, copper-coated and lead-coated fencing. Bare (uncoated) wires will, in all cases, be exposed as control samples at each test location.

Barbed wire samples will in all cases be made from 12½ gage line wire with 14 gage-4 point barb hog wire. Again a wide range of zinc coatings will be tested and in addition barbed wire carrying aluminum barbs.

The fabricated products, such as fence, will be erected in the usual way at the selected test sites and left undisturbed for regular observation. The unfabricated wire specimens are to be specially mounted in small racks to facilitate shipment to a central testing laboratory for physical examination at predetermined intervals.

Test Sites; Many Specimens

The Wire Test Committee will set up these tests in widely scattered areas where fences are used in large quantities. A cross in the table below indicates the materials to be tested at the respective places.

	Farm Fence and Barbed Wire	Wire (Unfabricated)	Strand (Cable)	Chain Link Fencing
Pennsylvania State College, State College, Pa	x	x	x	
Purdue University, West LaFayette, Ind	x	x	x	x
Texas A. & M. College, College Station, Texas	x	x	x	
Iowa State College, Ames, Iowa	x	x	x	
Cornell University, Ithaca, N. Y	x	x	x	x
Kansas State College, Manhattan, Kansas	x	x	x	
*Pittsburgh, Pa		x	x	x
*Sandy Hook, N. J		x	x	x
*Bridgeport, Conn		x	x	x

* The starred locations are not rural, but represent industrial or seacoast locations where further information on the durability of chain link fencing and other fabricated wire products is desired.

Some conception of the magnitude of this investigation is obtained from the following numerical summary of the samples involved:

	Number of Samples per Location	Number of Locations	Total Number of Samples per Exposure Period	Grand Total
Plain wire	142	9	1278	12 474
Farm field fencing	96	6	576	576
Barbed wire	27	6	162	162
Strand	13	9	117	117
Chain link fencing	6	5	30	30
				13 359

Certain factors which affect the service life of fencing, such as mechanical damage and ruggedness of fence construction on the farm, will not be studied in the present tests, but the data available upon completion of the program will go far toward enabling the consumer or his technical advisors to make a proper comparison of the performance of fences which differ as regards base metal, wire gage, type and weight of coating, and to decide which type will meet his particular needs most economically.

The Wire Test Committee has recognized that fence fabric or wire products commercially available on the open market would not be a suitable source of supply for test samples since the tests are focused on an evaluation of types of

(*Concluded on page 11*)

Compression Test Specimen for Mortars

(*Concluded from page 5*)

specimen is tested on its side cannot be estimated on the basis of evidence available.[1] Certainly it would vary with different mixtures and would in any case probably be difficult to evaluate. While this point is mentioned for the sake of completeness, it is not felt that it is of first importance. Apparently in the large numbers of cube tests made there has been no striking indication that the results were influenced materially by the fact that the specimens were tested on their side as cast.

4. Advantages of the 2 by 4-in. cylinder as a compression specimen:

(*a*) Geometrically, the 2 by 4-in. cylinder is similar to the specimens which have been adopted as standard for concrete.

(*b*) The specimen is of sufficient height to obviate the overlapping of the end cones and to give a gage length suitable for measurements of both longitudinal and lateral strains.

(*c*) There are no objectionable corners.

(*d*) Load is applied in the direction of the depth as cast and all vertical elements of specimens should be of about the same stiffness and strength, that is, horizontal cross-sections should be reasonably uniform.

5. Disadvantage of the 2 by 4-in. cylinder.

The specimen must be capped in order to provide a plane upper surface for the application of the load.

6. The 2 by 2 by 4-in. prism as a compression specimen preferable to either the 2-in. cube or the 2 by 4-in. cylinder.

From the foregoing detailed discussions of the cube and cylinder it is apparent that the major disadvantages of the cube (its shortness) and that of the cylinder (the necessity for capping to obtain a plane top end), can both be avoided by the adoption of a prism to be cast on its side. The adoption of such a specimen constitutes less of a departure from current practice than the present difference between the two more or less established current practices.

7. Miscellaneous considerations.

(*a*) *An alternative specimen.* Some thought has been given to attempting to reach a compromise that would give a closer approach to a circular cross-section. An eight-sided prism 4 in. long could be cast on its side, but the form would be more complicated and the filling operation somewhat more difficult. The added objections appear to more than outweigh the gain from increased roundness.

(*b*) *Compression specimens obtained from beams.* There is an increasing tendency to make use of both flexure and compression tests or to supplement flexure data with supporting compression evidence. Small mortar beams, usually of square cross-section, have been widely used for flexure tests and to a lesser extent for tests of volumetric change, flexural flow under sustained loading, etc. To be able to procure standard samples for compression testing by cutting fragments of these beams into suitable lengths (and capping with sulfur compound or grinding if necessary) has obvious advantages. The same technique can be applied to beams of rectangular instead of square cross-section if the height of specimen be not less than twice the greater lateral dimension.[1]

(*c*) *Specimens for compression tests of concrete.* If the prism of square cross-section is adopted as standard for mortar tests, does it not follow that geometrically similar specimens should be adopted for concrete? The correct answer is probably "yes, but not until the type has been tried out fully as a specimen for mortars." All of the arguments are equally pertinent, but the status differs in the following respects:

1. The capping operation, while no simpler, represents a lower percentage of the total work involved in sampling, casting, storing, etc.

2. At the present time practice is unified on the concrete cylinder. In American practice the concrete cube nearly disappeared years ago. There is not present, therefore, the same divided practice that exists in the case of mortars.

3. When, as and if the mortar prism proves itself, the change could be made very simply for the concrete. Moreover, the strengths and other properties obtained from prisms and cylinders of equal height-diameter ratios are probably so nearly the same that no past test results would be invalidated by a change. For the same reason there is no need of an immediate change on account of present or proposed research projects. Subject to experimental verification, the statement may be ventured that differences between the results of tests on cylinders and on the corresponding prisms will be difficult to detect.

(*d*) *Molds.* The adoption of the prism would involve the scrapping of cube molds by some laboratories and of cylinder molds by others. At the present time there is some tendency toward the adoption of water-tight molds. Few laboratories now have or use molds which are entirely water-tight. It is not within the province of this paper to discuss whether water-tight molds should be required, but it is clear that such a requirement would involve a virtual scrapping of all existing molds and it would be an excellent time for the inauguration of such a change as that proposed.

Looking into the feasibility of the prism from the standpoint of molding equipment, there seems to be no question about the relatively simple water-tight molds that could be made in single units or in gangs for casting in one group as many specimens as could be handled conveniently.

Conclusions

1. It is recommended that the 2 by 2 by 4-in. mortar prism be definitely adopted as the standard test specimen for mortars, replacing the 2-in. cube and the 2 by 4-in. cylinder.

2. It is suggested that steps be taken to specify the essential features of molds which will produce satisfactory specimens.

3. It is further suggested that no immediate change be made in the compression specimen for concrete, but that the matter be studied with a view to the substitution of square prisms for the cylinders now employed.

[1] Careful observation by the writer and by others shows that the top of a compression specimen (when tested upright as cast) often starts to crumple or crush slightly at the base of the cap before other signs of damage appear. That this is evidence of a weaker layer of material near the top of the specimen as cast is indicated by the fact that the same crushing occurs when the specimen is tested bottom upward. This matter is discussed further in an article entitled "Water Gain and Allied Phenomena," *Engineering News-Record*, February 10, 1927. In unpublished tests made by W. M. Dunagan, analyses of fresh concrete taken from tall specimens at different heights seemed to show that the wetter (and therefore the weaker) layer of concrete was concentrated quite near the top surface and that there was little if any lack of uniformity from the bottom to within a short distance of the top of the pour. This evidence is reassuring. At least there does not appear to be a progressive variation in quality from the bottom to the top as cast and it is possible that a slight overfilling of the mold with subsequent striking off (say in an hour or two) would practically eliminate the objectionable effects of water-gain.

[1] Height of specimen has little effect on the compressive strength obtained within a range of two and six or eight diameters. Below two diameters there is a pronounced increase in the ultimate load carried as the height decreases and the load falls off for heights in excess of eight or ten diameters, as column action comes into play.

Index to Standards Issued

The Index to A.S.T.M. Standards and Tentative Standards, published annually in December, is being used more and more widely and many requests for copies have been received.

The current issue accompanying this BULLETIN gives under appropriate key words, the titles of all Society standards and tentative standards, together with page references to the A.S.T.M. publications in which they can be found. Each specification and test method is indexed under the principal subjects it covers. Purchasing agents, architects, testing engineers and many others who use specifications and tests regularly find the Index of considerable assistance, not only in locating a particular A.S.T.M. specification or method of test, but also in determining whether or not the Society has issued a standard on a specific subject. It is suggested that members place the Index in their files next to their Book of Standards and Book of Tentative Standards for convenience. When it is necessary to locate a specification or determine whether it is standard or tentative, the Index is very serviceable. A list in numeric sequence is also included.

The format of the new Index has been changed to include advertising display space in the body of the book and a number of producers of materials have reserved space.

Copies of the Index are furnished on request, without charge, and if members desire additional copies they should write A.S.T.M. Headquarters.

Volume on Refractory Materials

In 1932, the Society issued a compilation of A.S.T.M. standards on refractory materials, together with the Manual on Interpretation of Refractory Test Data. Because of the widespread interest in the book, the edition was exhausted early and Committee C-8 on Refractories which sponsored the compilation, has prepared an extensively revised and greatly amplified edition, to be ready February 1.

Copies of this publication, comprising some 150 pages, will be available to members at 75 cents each with special prices on orders for ten or more. The list price is $1.00.

Wire Test Program

(Concluded from page 9)

fencing—various base metals, different types of metallic protective coatings for steel wire, a wide range of weights of coating, various gages of wire. Further, the committee feels it important that the samples should represent more classifications as to weight of coating than are obtainable from commercial specimens; it is also important that these various types as to weight of coating should be controlled to a narrow range. The manufacturers have agreed to prepare specially these various specimens so that in the end the Committee will have dependable information to use.

Cooperation in Program

The committee has had the support of most of the nationally recognized fence manufacturers who have contributed to the funds necessary, their engineers' time, samples and the laboratory work to characterize them. The committee has been assisted by experts from the agricultural colleges and societies who have aided in planning the tests and have made available test sites for the long time necessary.

As the tests progress to a point where accurate engineering information regarding the durability of fencing becomes available, this will be released promptly through the publications of A.S.T.M., State Extension Bureaus, and farm journals.

Committee to Study Soil Testing Methods

The growing realization of the importance of adequate knowledge of the properties of subgrade soils, especially as related to highway, building and dam construction, has led A.S.T.M. Committee D-4 on Road and Paving Materials to appoint a Committee on Soils for Highway Construction, headed by C. A. Hogentogler, Senior Highway Engineer, U. S. Bureau of Public Roads. This group will study the present tests used in evaluating soils for highway construction with the purpose of developing standard tests.

A survey made in 1932 indicated that 26 states relied in varying degrees on subgrade properties as factors in highway design. Thirteen of these have laboratories equipped to perform all routine tests suggested by the U. S. Bureau of Public Roads. For a number of years this Bureau has been investigating soils and has developed a great deal of data on the important properties and methods of their determination.

In a paper on "Subgrade Soil Testing Methods" by Messrs. Hogentogler and Willis, presented at the A.S.T.M. annual meeting this year, it was indicated that the five physical properties controlling soil performance from the engineering standpoint are stability, compressibility, elasticity, permeability and capillarity. The authors state that there are four kinds of tests which evaluate physical characteristics responsible for all soil deformations, regardless of causes:

1. Disturbed soils and those close enough to the surface of the ground to be influenced by change of moisture, temperature, frost, etc., are tested in a dried and powdered state for shrinkage, plasticity and similar properties, which disclose the characteristics of the soil constituents exclusive of soil structure.
2. Soils to be stabilized with admixtures or manipulation in practice are tested in samples prepared according to the construction procedure for properties required in stable fills, subgrades and road surfaces.
3. Soils located below the line of seasonal change are tested by means of undisturbed samples in the laboratory or loading the soil in place in the profile for such engineering properties as compressibility, elasticity and stability which are furnished by both soil structure and soil materials.
4. Soils located below the line of seasonal change, whose structure is disturbed by the penetration of piles or other construction operations, are investigated by loading test piles in place or samples remolded from natural structure and at natural moisture content in the laboratory.

The new committee will study certain specific tests already in use falling in some of the above classifications.

Annual Meeting Plans

(Concluded from page 2)

Press Service—Publicity Committee
F. Burton, *Chairman*, Consulting Engineer
Herbert R. Browne, Michigan Alkali Co., Wyandotte
G. E. Conde, E. I. du Pont de Nemours and Co., Flint
L. A. Danse, Cadillac Motor Car Co.
C. F. Gilchrist, Electric Auto Lite Co., Toledo

Ladies Entertainment Committee
Mrs. F. O. Clements, *Chairman*
(Other members to be appointed)

Exhibit Concurrently with Meeting

The 1935 Exhibit of Testing Apparatus and Related Equipment will be in progress concurrently with the annual meeting. Latest developments in equipment and machines, laboratory supplies and instruments will be shown and apparatus used by research laboratories and A.S.T.M. committees in special testing and research programs will also be on display. The Exhibits Committee, personnel of which is given above, will cooperate in developing plans for the Exhibit, particularly in connection with the non-commercial displays.

New Members to December 15, 1934

The following 10 members were elected from October 26 to December 15, 1934:

Company Member (1)

QUAKER STATE OIL REFINING CORP., E. E. Ebner, Refinery Superintendent, Emlenton, Pa.

Individual Members (8)

CROSBY, V. A., Metallurgical Engineer, Climax Molybdenum Co., 15 E. Bethune Ave., Detroit, Mich.

DARSEY, V. M., Manager, Analytical Dept., Parker Rust-Proof Co., 2177 E. Milwaukee Ave., Detroit, Mich.

JONES, W. A., Secretary, Bituminous Coal Code Authority, Eastern Subdivision of Division No. 1, Lincoln Trust Bldg., Altoona, Pa.

KLEIN, OTTO, Director, Schaffer & Budenberg G. m. b. H., Magdeburg-Buckau, Germany.

SCHNEIDER, WALTER, Director, Forschungsinstitut der Mannesmannröhren-Werke, Duisburg-Wanheim, Germany.

SCHRODER, E. M., Chief Chemist, Australian Portland Cement Proprietory, Ltd., Sydney, N. S. W., Australia. For mail: 20 Aphrasia St., Newtown, Geelong, Victoria, Australia.

TRACY, GEORGE, Chemist, Berry Brothers, Inc., 211 Leib St., Detroit, Mich.

VON FRANKENBERG, A., Deutsche Eisenwerke A. G., Mülheim-Ruhr, Germany.

Junior Member (1)

WHITE, D. F., School Architect and Instructor, Division of Mechanical Industries, Tuskegee Inst., Tuskegee, Ala.

Bridge and Structural Congress

The final report of the First Congress of the International Association for Bridge and Structural Engineering (I.A.B.S.T.E.) held in Paris, has recently been issued in the form of a 715-page volume. This contains the many papers presented, conclusions of the working meetings, list of participants in the Congress, etc. The some 26 papers and extensive discussion are arranged in the following classification:

Stability and strength of structural members subjected to compression and bending
Slabs in reinforced concrete structures
Welding in steel structural work
Large girder bridges in reinforced concrete
Dynamics of bridges
Development of the statics of reinforced concrete, with regard to the properties of the material used
Girders in conjunction with concrete
Research concerning building ground

Each item is printed in the language used by the respective contributors—English, German or French, but French translations are given for all. Members of the Association and those who participated in the Congress may purchase copies at special prices—and copies are on sale to others at 36 Swiss Francs per copy. Orders and inquiries should be sent to Leemann & Co., Stockerstrasse 64, Zurich, Switzerland.

Long-Time Members

(*Concluded from page 3*)

charge of specifications and special investigations and since then has devoted himself to consulting practice.

Like a number of other long-time members of the Society in the railroad field he has been an active and valuable committee worker. From 1910 to 1933 he served on Committee B-2 on Non-Ferrous Metals and Alloys and was a member of Committee A-1 on Steel for twenty years. His continuous membership on Committee A-5 on Corrosion of Iron and Steel, of which he is at present Vice-Chairman, dates from 1914 and on Committee D-1 on Preservative Coatings for Structural Materials from 1911. Becoming a member of Committee A-2 on Wrought Iron in 1913, he has served since that time and was chairman 1917 to 1924.

He is a member of Committee E-9 on Research and was a member of the Society's Executive Committee, 1929 to 1931.

Personals

News Items concerning the activities of our members will be welcomed for inclusion in this column. Such news items are of very great interest to the membership at large and the number should be considerably augmented

W. H. FULWEILER, Chemical Engineer, United Gas Improvement Co., recently received the Beal Medal of the American Gas Association at its recent meeting in Atlantic City. This Medal, established in 1897 for the best technical paper delivered at the A.G.A. meetings, was awarded to Mr. Fulweiler for his papers describing the research achievements of the laboratories of his company. Mr. Fulweiler also won this award in 1908 when it was given by the American Gas Institute, one of the predecessor organizations of the American Gas Association.

At the recent annual convention of the American Foundrymen's Association DAN M. AVEY, Editor, *The Foundry*, was chosen president, and B. H. JOHNSON, R. D. Wood Co., elected vice-president. Among the directors chosen to serve for three years are E. W. CAMPION, General Manager, The Bonney-Floyd Co. and SAM TOUR, Vice-President, Lucius Pitkin, Inc. Included in the A.F.A. past-presidents who attended the "old-timers" dinner at the convention were the following A.S.T.M. members: R. A. BULL, Consultant on Steel Castings; G. H. CLAMER, President and General Manager, The Ajax Metal Co.; L. W. OLSON, Factory Manager, The Ohio Brass Co.; S. W. UTLEY, Vice-President and General Manager, Detroit Steel Casting Co. Among those present at the dinner who registered at the first A.F.A. Convention in 1896 were the following A.S.T.M. members: J. M. DARKE, Engineer, Materials Testing Lab., General Electric Co.; G. T. JOHNSON, Vice-President, Buckeye Steel Castings Co.; and E. J. LAME, Sales Manager, R. D. Wood Co.

W. B. KOUWENHOVEN, Professor of Electrical Engineering, Johns Hopkins University has been nominated as one of the Directors of the American Institute of Electrical Engineers.

At the New York meeting of the American Society for Metals, B. F. SHEPHERD, Chief Metallurgist, Ingersoll-Rand Co., was elected President; R. S. ARCHER, Chief Metallurgist, Chicago District, Republic Steel Corp., was chosen Vice-President and G. B. WATERHOUSE, Professor of Metallurgy, Massachusetts Institute of Technology, was chosen a Director.

The American Society for Metals has established the ALBERT SAUVEUR Achievement Medal to be awarded for outstanding achievement in the field of metallurgy, and the first award of this medal has been made to Doctor SAUVEUR, Professor of Metallurgy, Harvard University. He has been a member of the A.S.T.M. since 1896.

F. B. COYLE has recently become connected with Sandusky Foundry & Machinery Co., Sandusky, Ohio.

WILBUR W. SANDERS, formerly Metallurgical Engineer, Buick Motor Co., Flint, Mich., is now Process Engineer, Delco Products Division, General Motors Corp., Dayton, Ohio.

W. C. SHUTTS is now connected with the Standard Oil Development Co., New York City. He was formerly Engineer of Production, Humble Oil and Refining Co., Houston, Texas.

LUCIUS PITKIN, Inc., announces the appointment to their staff of Mr. E. P. Polushkin as Associate Metallurgist, with particular reference to research and development.

Necrology

We announce with regret the death of the following:

WILLIAM H. BURR, Consulting Engineer, Board of Water Supply, New York City. Member since 1899.

J. H. S. DICKENSON, Metallurgist-in-Chief and Special Director, English Steel Corp., Ltd., Vickers Works, Sheffield, England. Member since 1925.

GWYNNE EVANS, Assistant Metallurgical Engineer, The Youngstown Sheet and Tube Co., East Chicago, Ind. Member since 1930.

E. C. HOLTON, Chief Chemist, Department of Executive Research, The Sherwin-Williams Co., Cleveland, Ohio. Mr. Holton was a member of Committees B-2 on Non-Ferrous Metals and Alloys and D-1 on Preservative Coatings.

MILO S. KETCHUM, Dean, College of Engineering, and Director-Emeritus, Engineering Experiment Station, University of Illinois, Urbana, Ill. Member since 1905.